US Army Corps of Engineers®
Engineer Research and Development Center

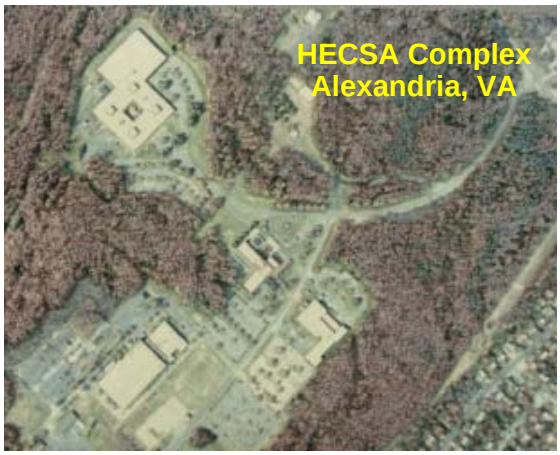
3D Solid Modeling

Description

Using state-of-the-art solid modeling technology, ERDC's Topographic Engineering Center (TEC) has the capability to produce durable, solid, Three-dimensional (3D) models quickly, easily, and relatively inexpensively from digital geospatial information. This capability fills the need to accurately depict complex geographic features and their interrelationships for DOD agencies in support of military operations. Traditional methods of 3D modeling such as sand tables or scale models are labor intensive, slow (may take weeks or longer to build), and have difficulty depicting relief or vertical features to scale.

Capabilities

TEC experts exploit digital elevation models, often using Light Detection and Ranging (LIDAR), combined with imagery to produce solid models that realistically depict operational environments. Individual models take from 8 to 12 hours to produce, depending on the size and complexity of the required product. Models can be produced in components that may be connected to produce models of virtually unlimited size. The end products are lightweight, easily transportable models that are durable enough to withstand repeated use in a variety of operational environments. These highly detailed models increase users' understanding of complex geospatial features and are of particular value in representing built-up areas.



Supporting Technology

TEC produces 3D solid models using the ZCorp Model 810 printer's powder-binder technology. This 3D printer has the capability to produce 3D solid models with maximum dimensions of 20 x 24 x 16 in. (500 x 600 x 400 mm).

Benefits

3D solid terrain models have long been the preferred tool for visualizing terrain because scaled terrain representations constructed out of solid materials are immediately familiar and well understood. These models allow users to view a landscape from multiple perspectives, and to directly interact with landscape during course-of-action development, mission planning and rehearsal, site selection, terrain visualization and analysis, hydrological analysis, environmental analysis, and civil engineering. TEC's current tools and methodologies can produce 3D solid models quickly, accurately, and at low cost.

Success Stories

TEC supported the 2005 Presidential Inauguration and 2006 State of the Union Address by building models for the Chemical and Biological Incident Response Force in Washington, D.C. In 2005, TEC built models of New Orleans for HQUSACE in support of the Hurricane Katrina response effort.

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